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**Patent and Trademark Office**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/600,208	07/12/00	ENGELHARDT	293.000218

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EXAMINER

NGUYEN, T

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 11/07/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

**Office Action Summary**

Application No.

09/600,208

Applicant(s)

ENGELHARDT ET AL.

Examiner

Thong Q Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 August 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 17-39 is/are pending in the application.
- 4a) Of the above claim(s) 18, 26, 27 and 31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17, 19-25, 28-30, 32-37 and 39 is/are rejected.
- 7) ☒ Claim(s) 38 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Response to Amendment***

1. The present Office action is made in response to the Pre-Amendment (Paper No. 4) filed on 07/12/2001 and the Election& Pre-Amendment (Paper No. 9) filed on 08/06/2001.

### ***Election/Restrictions***

2. Applicant's election with traverse of species (b), claims 19-23, 28-30 and 32-33 in Paper No. 9 of 08/06/2001 is acknowledged. The traversal is on the ground(s) that both the species (a) and species (b) are directed to a special technical feature, namely "an illumination optical system arranged in said illumination beam path for modifying an illumination diameter of an illumination beam of said microscope" (Election/Amendment, Paper No. 9, page 2). This is not found persuasive because the Examiner is of opinion that the species (a) and species (b) are directed to different special technical feature concerning the movement of the optical elements constituting the illumination optical system, and the feature mentioned by the applicant is merely a general feature of an illumination system for use in a microscope. An illumination system having feature for adjusting the diameter of an illumination light does not need to be used for microscope only. It can be used in any kind of optical system such as a video camera, a regular camera, a telescope, a photocopier, etc.... Second, the mechanism for moving an optical element of an illuminating system in an axial direction is different from the mechanism for moving the element of an illuminating system in a radial direction.

The requirement is still deemed proper and is therefore made FINAL.

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***As a result of applicant's election, claims 17, 19-25, 28-30, and 32-39 are examined in this Office action, and claims 18, 26-27 and 31 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected claims.***

***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Drawings***

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore the following features recited in the claims must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

First, the feature concerning the use of an optical component for altering an intensity distribution of the illumination beam as recited in claim 34 wherein the optical component is in the form of a lens as recited in claim 35 or in the form of an annular stop as recited in claim 36 or in the form of a holographically generating optical element as recited in claim 37; Second, the feature concerning the plurality of objectives as recited in claim 24; and Third, the feature concerning the further light source and the additional input for coupling the light from the light source into the illuminated light path as recited in claim 38 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

***Specification***

5. The lengthy specification which was amended by the Pre-Amendment (Paper No. 4) filed on 07/12/2001 has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

6. The disclosure is objected to because of the following informalities: a) Page 3: lines 21-23, the description thereof "The illumination...variable focal length" is not understood. What kind of system having both a fixed focal intercept and variable focal length does applicant imply here? b) Page 3: lines 26-29, the description thereof "It is also... the focal lengths" is unclear. What does applicant mean by " $f_1/f_2$ " (line 28)? c) Page 4: lines 28-29, the reference to the claims for the purpose of providing technical features of the inventive device is improper. There are still some grammatical and idiomatic errors in the specification. Applicant should carefully proofread the specification. Appropriate correction is required.

7. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The feature concerning the relationship in focal lengths between the variable optical system and the expanding system as recited in claim 33.

***Claim Objections***

8. Claim 38 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is

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required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 38 recites a coupling system for coupling another light source system into the illuminating light path of an optical arrangement; however, the base claim recites only an illumination system located in the illuminated light path for the purpose of modifying the diameter of the illuminated light beam.

***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 24-25, 30, and 34-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) Claim 24 is functional. The claim recites functional language thereof "said microscope... objectives" (lines 1-4) without reciting sufficient structure to warrant the presence of functional language. In particular, it is unclear about the manner in which the illumination optical system can modify the diameter of the illuminated light beam for matching with the selected objective.

c) Claim 25 is also rejected for the similar reason as set forth in element b) above. Further, it is unclear how the illumination optical system can **automatically** modify the illumination diameter (Examiner's emphasis).

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d) Claim 30 is indefinite by the recitation thereof "said illumination... focal length" (lines 1-2). What does applicant mean by the mentioned recitation? What kind of structure of the claimed collimating optical system?

e) Claim 38 is indefinite because 1) the feature "the entry pupil of the objective" (line 3) lacks a proper antecedent basis; and 2) the feature thereof "is adaptable... beam path" is unclear. What does applicant mean by that mentioned feature?

f) The remaining claims are dependent upon the rejected base claims and thus inherit the deficiencies thereof.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 17, 19-21, 24-25, 30, 32-33 and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamamoto (U.S. Patent No. 5,184,012).

Yamamoto discloses a scanning microscope having an illuminating system for illuminating a sample. The illuminating system as described at columns 4-6 and shown in figures 1-3 comprises a beam expanding system (30) disposed on an optical light path from a laser source (see the prior art as described at column 1 and shown in figure 5) and a scanning system (34 and 35) for scanning the illuminated light beam on the sample (A). The beam expanding system (30) as

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described at column 5 and shown in figure 3A will expand the illuminating diameter for matching with a particular objective lens used in the scanning microscope (see also column 6 and fig. 2 which discloses the interchangeability of different objective lenses). It is also noted that in the embodiment described at column 5 and shown in figure 3A, the beam expanding lens system is a zoom lens system in which the first lens element (41) acts as an additional lens having a fixed focal length for coupling the light from the laser source, and the second and third lens elements (43, 42), which in combination having a variable focal length, are movable along the illuminated path. As a result, the collimation in the light beam exits from the beam expanding lens system will expand as a function of the focal length ratio between the fixed lens and the movable lenses. With regard to the feature concerning the adjustment in the beam diameter of the illuminating beam being automatically in response to a particular objective lens being used, such a feature is also disclosed by Yamamoto as can be seen in column 4, lines 35+ and column 5, lines 45+. With regard to the feature that the scanning microscope is a so-called "multiphoton" scanning microscope, such feature is considered as an intended use of the scanning microscope because the claim does not provide any limitation for the making the scanning microscope as the so-called "multiphoton" scanning microscope.

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:



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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (U.S. Patent No. 5,184,012) in view of Takagi et al (U.S. Patent No. 5,140,458, submitted by applicant).

The zoom beam expanding system as provided by Yamamoto meets all of the feature recited in the present claim 22 except he does not clearly state the movement of the movable lens element(s) is made by a motorized manner; however, the use of a motorized system for moving at least one lens for the purpose of changing the position of the at least movable lens with respect to other lens of a lens system used in an illuminating system of a microscope is clearly suggested to one skilled in the art as can be seen in the microscope having an illuminating system provided by Takagi et al. See column 3, lines 16+, for example. It is also noted that while applicant has used the term "video camera zoom" for the lens system in the present claim 23; however, since the claim has not provided any specific feature/limitation for the so-called "video camera zoom" and the operation of a zoom lens system, i.e., movement of at least one lens element with respect to other lens element(s) constituting the lens system, is similar in all of optical device; therefore, the use of a motorized system for moving at least one lens with respect to other lens elements as provided by Takagi et al meets the requirement/limitation of claim 23. Thus, it would have been obvious to one skilled in the art at the time the invention was made to utilize

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a motorized system as suggested by Takagi et al for moving at least one lens in a lens system disposed in the illuminating path of a microscope as that of Yamamoto for the purpose of adjusting the magnification thereof.

15. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (U.S. Patent No. 5,184,012) with or without Dabbs et al (U.S. Patent No. 5,054,926).

The illuminating system for use with a scanning microscope wherein the illuminating system comprises a laser source and a beam expanding apparatus disposed after the laser source as provided by Yamamoto meets all of the features recited in claims 28-29 except that he does not state that the laser source can be in the form of a point light source (as claimed in present claim 28) or an optical fiber (as claimed in the present claim 29); however, such use of light source as claimed is merely that of a preferred embodiment and no criticality has been disclosed. The support for that conclusion is found in the present specification at pages 5-6 in which applicant has stated that the light source is a laser source. Further, the use of a point light source which is provided by a laser source or a laser diode or a combination of a light source with an optical fiber is clearly known to one skilled in the art as can be seen in the illuminating system provided by Dabbs et al. See column 4, lines 40+. Thus, absent any showing of criticality, it would have been obvious to one skilled in the art at the time the invention was made to utilize any suitable light source or a combination of

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available light sources and fiber for the purpose of providing a light beam which is in the form of a point light source or a collimating light beam.

16. Claims 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto (U.S. Patent No. 5,184,012) in view of Kato (U.S. Patent No. 4,530,578, submitted by applicant).

The illuminating system for use with a scanning microscope wherein the illuminating system comprises a laser source and a beam expanding apparatus disposed after the laser source as provided by Yamamoto meets all of the features recited in claims 34-36 except the feature concerning the use of an additional element in the form of a lens for the purpose of varying the light intensity. However, the use of lens systems each comprises at least one lens element and stop between a light source having fiber and a beam-expanding system for the purpose of varying the light intensity is known to one skilled in the art as can be seen in the illuminating system for use with a microscope provided by Kato. See columns 2-3 and figs. 3. It is also noted that an adjustment in the diameter of a stop for controlling the beam diameter passing through the stop is also within the level of one skilled in the art. Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the illuminating system provided by Yamamoto by using an additional optics between the light source and the beam-expanding system as suggested by Kato for the purpose of varying the light intensity for the purpose of adjusting the light intensity near the edge of the illuminating beam.

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17. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto in view of Kato as applied to claim 34 above with or without Kain (U.S. Patent No. 5,672,880).

The combined illuminating system for use with a scanning microscope wherein the illuminating system comprises a laser source, a beam expanding apparatus disposed after the laser source and an additional system between for varying the light intensity near the edge of a light beam as provided by Yamamoto and Kato meets all of the feature recited in claim 36 except the feature concerning the use of an additional element in the form of a holographic element for the purpose of varying the light intensity. However, the use of lens system between a light source and a beam-expanding system wherein the lens element is a holographic lens element for the purpose of varying the light intensity as claimed is merely that of a preferred embodiment and no criticality has been disclosed. The support for that conclusion is found in the present specification at page 4 in which applicant has stated that the additional element is a conventional lens element or an annular stop. Further, the use of a holographic lens element between a light source and a beam-expanding system is clearly known to one skilled in the art as can be seen in the illuminating system provided by Kain. See columns 4-5. Thus, absent any showing of criticality, it would have been obvious to one skilled in the art at the time the invention was made to utilize any suitable optical elements including a holographic lens element as suggested by Kain between

the light source and the beam-expanding system for the purpose of adjusting the light intensity at the edge of the light beam.

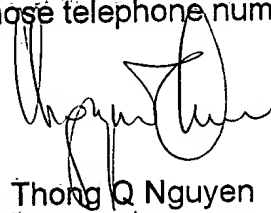
**Conclusion**

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thong Q Nguyen whose telephone number is 703 308 4814. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703 308 1687. The fax phone numbers for the organization where this application or proceeding is assigned are 703 308 7724 for regular communications and 703 308 7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.



Thong Q Nguyen  
Primary Examiner  
Art Unit 2872

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October 30, 2001